

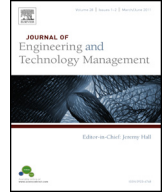


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# Beyond technological catch-up: An empirical investigation of further innovative capability accumulation outcomes in latecomer firms with evidence from Brazil



Paulo N. Figueiredo \*

Brazilian School of Public and Business Administration (EBAPE), Getulio Vargas Foundation (FGV), Brazil

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### ABSTRACT

This article examines outcomes that are achieved by latecomer firms by accumulating innovative capabilities. By drawing on fieldwork evidence from pulp and paper firms in Brazil from 1950 to 2010, it was found that (1) firms accumulated innovative capabilities that allowed them to become world leaders in the eucalyptus forestry segment of the global pulp and paper industry; (2) in addition to technological catch-up, the accumulation of these innovative capabilities resulted in outcomes that generated benefits within these firms such as (i) implementing inventive and innovative activities, (ii) consistently improving several parameters of operational and environment-related performance, and (iii) creating various patterns of corporate growth; and (3) these outcomes were achieved not just by research-based and patent-related capabilities but mainly by a mix of innovative capability levels that have varying degrees of novelty and complexity for diverse technological functions. Therefore, accumulating a wide range of types and levels of innovative capabilities does pay off for innovative firms, their industries and (ultimately) for their economies. By combining a novel approach to examining firm capabilities with findings from inductive fieldwork, this article generates new empirical and methodological insights for the long-standing debate about innovative capabilities as a fundamental source of a firm's competitive performance. This article should draw

\* Correspondence address: Brazilian School of Public and Business Administration (EBAPE), Getulio Vargas Foundation (FGV), Praia de Botafogo, 190, 22253-900 Rio de Janeiro, RJ, Brazil. Tel.: +55 021 3799 5742.

E-mail address: [pnf@fgv.br](mailto:pnf@fgv.br).

the attention of managers to the importance of having a multiplicity of types and levels of capabilities to achieve desired outcomes; in addition, it should encourage policy makers in developing economies to adopt a comprehensive view of innovative activities and place firm-centered innovation capability accumulation at the center of industrial innovation policies.

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## Introduction

This article reports on an empirical investigation of outcomes achieved by firms in developing and emerging economies (known as latecomers) that are related to their accumulation of innovative capabilities. Unlike most previous studies, this article explores outcomes in addition to technological catch-up. The accumulation of innovative capabilities has been a central topic in the study of latecomer firms since the early 1970s when [Cooper \(1970\)](#) examined the mechanisms by which international technology transfer influenced the long-term accumulation of these capabilities in technology-importing firms from developing economies.

Research on innovative capabilities in latecomer firms moved forward with the work of a Latin American group led by Jorge Katz that initiated the first systematic research program on these issues in the mid-1970s. Drawing on detailed firm-level studies, this group unveiled significant technological capabilities that permitted firms to undertake diverse innovative activities across different industries (for a compilation see [Katz, 1987](#)). In so doing, they challenged contemporaneous prevailing arguments that technological activities in latecomer firms lacked creativity and were based merely on the use of technology generated in advanced economies. This initiative influenced the emergence of other studies in Asia (e.g., [Bell et al., 1982](#); [Lall, 1987](#)) that eventually gave rise to a research field devoted to understanding the process of technological capability accumulation in latecomer firms and industries (for analytical overviews, see [Bell and Pavitt, 1993](#); [Bell, 2006](#); [Bell and Figueiredo, 2012](#)).

Following the rise of several developing economies in the early 1990s, there have been a steadily growing number of studies on innovative capability accumulation in latecomer firms, including studies on its sources, underlying learning mechanisms, and consequences. However, when studies examine the consequences of accumulating innovation capabilities, they focus primarily on the ways in which latecomer firms close their innovative capability gaps with their counterparts in advanced economies or engage in technological catch-up. Consequently, there is a paucity of empirical research on the types of outcomes, other than technological catch-up, that are achieved by latecomer firms that are accumulating innovative capabilities. Although prior research suggests that the manner in which these capabilities are accumulated has positive and/or negative implications for latecomer firms' competitive performance (e.g., [Bell et al., 1982](#); [Katz, 1987](#); [Figueiredo, 2002](#)), there is a dearth of empirical studies over the past ten years that would help extend our understanding of the consequences of innovative capability accumulation in latecomer firms.

This study is intended to contribute to filling this research gap by exploring certain outcomes of innovative capability accumulation (beyond technological catch-up) that latecomer firms have achieved by drawing on innovative capabilities accumulated during their lifetimes. To that end, this article is based on an inductive multiple-case study of homogenous innovative latecomer firms utilizing first-hand and long-term empirical evidence gathered in a recursive fieldwork process. This study also builds on previous related empirical research on innovative capability accumulation in latecomer firms and combines conceptual insights from the literature on innovation in latecomer firms and the strategic management literature. Thus, this article contributes to extending our understanding of the role of innovative capabilities as a source of firms' competitive performance. This topic has drawn the attention of researchers from different research traditions, including strategic management and innovative capability building in firms from emerging economies.

The remainder of this paper is structured as follows. The section "Study background and research question" presents the study's background leading to the article's research question, and the section

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